Demonstration 1 - Dimensional Instruments

ME3023 - Measurements in Mechanical Systems

Mechanical Engineering

Tennessee Technological University

Topic 2 - Using A Micrometer

Topic 2 - Using A Micrometer

- Overview
- Components
- Vernier Micrometer
- Digital Micrometer

Overview

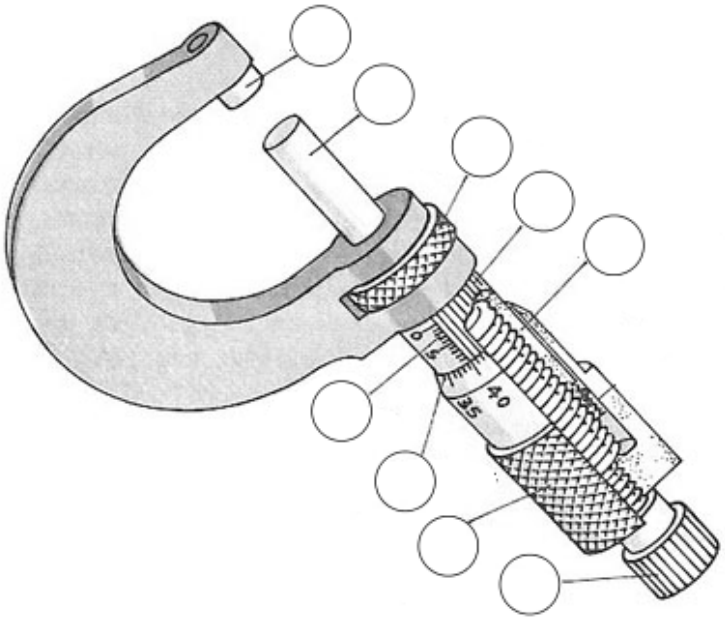
A micrometer, sometimes known as a micrometer screw gauge, is a device incorporating a calibrated screw widely used for accurate measurement of components[1] in mechanical engineering and machining as well as most mechanical trades, along with other metrological instruments such as dial, vernier, and digital calipers.

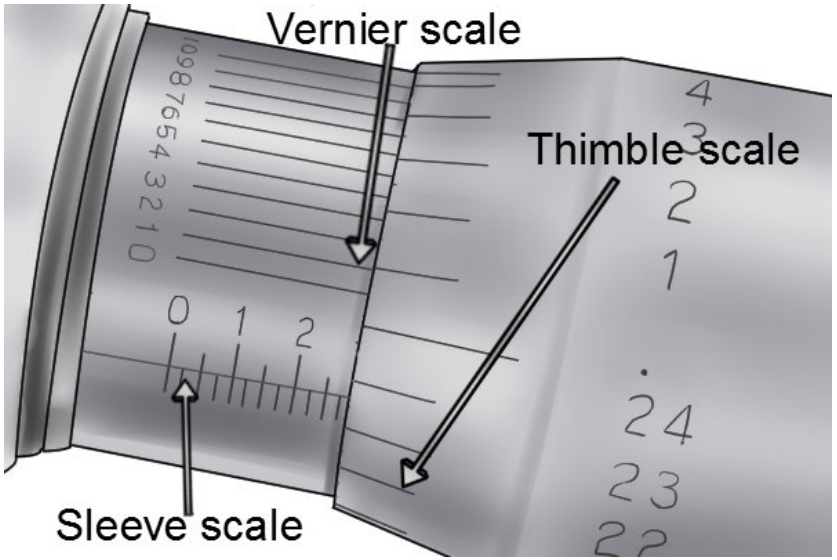
Text: Wikipedia

Unlike a pair of Vernier or digital calipers, most micrometers are designed to measure outside dimensions only.

Text: Theory and Design of Mechanical Measurements, 5th Edition

Components





1. Anvil
2. Spindle
3. Thimble
4. Lock Ring
5. Sleeve Scale
6. Thimble Scale
7. Vernier Scale
8. Ratchet (Clutch) Knob

Vernier Micrometer

A vernier scale is a visual aid to take an accurate measurement reading between two graduation markings on a linear scale by using mechanical interpolation; thereby increasing resolution and reducing measurement uncertainty by using Vernier acuity to reduce human estimation error. Wikipedia

Pros

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Cons

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Vernier Micrometer

Look at scale carefully and clean the jaws before you take a measurement. First look at the main scale then add the measurement from the Vernier scale.

Digital Micrometer

A digital micrometer contains an embedded processor and user interface to facilitate the measurement process.

Pros

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Cons

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Digital Micrometer

Make sure to clean the jaws and zero the instrument before you take a measurement. Also, be careful not to press the zero button on accident. On some models this is very easy to do.